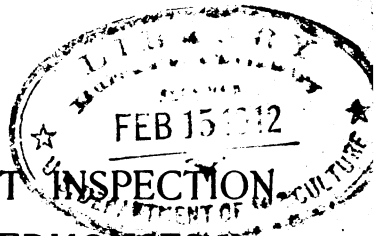


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A. D. MELVIN, CHIEF OF BUREAU.

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STATE AND MUNICIPAL MEAT INSPECTION  
AND MUNICIPAL SLAUGHTERHOUSES.

BY

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*Chief of the Bureau of Animal Industry.*

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## STATE AND MUNICIPAL MEAT INSPECTION AND MUNICIPAL SLAUGHTERHOUSES.

By A. D. MELVIN, D. V. S.,

*Chief of the Bureau of Animal Industry.*

It is estimated that a little more than one-half of the total meat supply of the United States comes under the inspection of the Federal Government. Most of the remainder receives no inspection whatever, while a portion is subjected to a limited inspection by State or local officers.

The principal object of meat inspection is to protect the consumer from diseased or otherwise unwholesome meat. This involves not only the inspection of the meat for the detection of disease or other unwholesome conditions but the requirement of sanitary conditions and equipment in the abattoirs and packing houses and the enforcement of sanitary methods in the preparation, curing, and handling of the meat. To meet the first requirement there should be a competent veterinary inspection of the carcass at the time of slaughter, or, in case inspection at the time of slaughter is impracticable, the inspection may be performed later if certain viscera are retained with the carcass. Too often the local meat-inspection service, where it exists at all, does not provide for an inspection of this kind, but consists merely in the inspection of the meat as it is offered for sale in the markets, with sometimes a sanitary supervision of the markets. Although such inspection has some value, it is far less important than the veterinary inspection of the carcass at the time of slaughter. The average consumer is able to determine for himself whether or not meat is tainted or spoiled, but he is not able to determine for himself whether or not it comes from an animal affected with a contagious disease. Neither can even a skilled inspector always detect disease in meat after it has been dressed and the viscera disposed of. The most important requirement in meat inspection, therefore, is to protect the consumer against dangers from which he can not protect himself, and this can be done only by a class of inspection that is not often provided for by local authorities.

### THE NEED FOR LOCAL INSPECTION.

The Federal meat-inspection system depends for its authority upon what is known as the interstate and foreign commerce clause of the Constitution of the United States, and this inspection is there-

fore limited to the product of establishments that are engaged in interstate or foreign commerce. The Federal Government is powerless to exercise any supervision over an establishment the meat of which is slaughtered, prepared, sold, and consumed entirely within a single State. It is a duty which the State or the municipality owes to its citizens to install and maintain a system of meat inspection that will afford adequate protection against diseased and unwholesome meats, so that all meat sold locally which has not passed the Federal inspection will come under the requirements of an efficient local inspection system.

Some idea of the necessity for this local inspection may be obtained by considering the extent of disease among live stock slaughtered for food, and the insanitary conditions under which much of the local meat supply is slaughtered and handled. Recent statistics of the Federal inspection show that nearly 2 per cent of the carcasses are affected with some disease or condition making it necessary to condemn them either in whole or in part. Of these condemnations nearly 87 per cent are due to tuberculosis alone. We find that about 1 per cent of the cattle and over 2 per cent of the hogs slaughtered under Federal inspection are affected with this disease to a greater or less extent. The establishments under Federal inspection draw a large proportion of their cattle from the ranges and feed lots of the West, where tuberculosis is rare, hence the percentage of this disease found in the Federal service is far below that which occurs in animals from the dairy regions, where the disease is much more prevalent. It is estimated that at least 10 per cent of the dairy cows in this country are affected with tuberculosis, and it is a well-known fact that dairy stock forms a much larger proportion of the animals killed at the small local slaughterhouses than at the large establishments under Federal inspection. One effect of the Federal inspection has been to cause the owners of diseased or suspicious-looking animals to send them for slaughter to an uninspected place rather than to an establishment where they would have to run the gantlet of strict inspection. For these reasons it is certain that the percentage of disease is considerably higher among animals slaughtered at the small local places than among those slaughtered under Federal inspection.

Uninspected slaughterhouses as a rule have many features that are not only objectionable but dangerous to health. The smell of the country slaughterhouse is proverbial, and the conditions at some of these places are inexpressibly foul and filthy. They are usually located in some out-of-the-way place, sometimes outside the corporate limits, often surrounded by stables or even being a part of a building which is also used as a stable, barn, or for some such purpose. Sometimes they are located on the banks of small streams and

pollute the water. Such places are often the means of spreading disease. It is frequently the custom to feed offal to hogs or to throw it where dogs, hogs, and rats have access to it. By this means trichina, tapeworms, and other animal parasites are disseminated, some of which are dangerous to man. Hog cholera, tuberculosis, and other contagious diseases may also be spread by such conditions. Usually there is no protection to the meat against rats, flies, and other insects and vermin, and this condition constitutes a dangerous source of contamination and infection.

The objectionable conditions are not confined to the little slaughterhouses in small communities. Even in some of the large cities there are large abattoirs which do a purely local business and at which the conditions and methods are exceedingly insanitary and where a very poor class of live stock is slaughtered.

#### PROBLEMS OF LOCAL INSPECTION.

In planning and executing State or municipal inspection much can be learned from the methods of the Federal meat-inspection service, although local inspection in small communities presents certain difficulties and problems not found in the Federal service. The objects to be gained and the principles to be applied are the same in each case, but the different conditions sometimes require different methods. The Federal inspection has been in operation for nearly 20 years, and for the last 4 years of this period it has been conducted under the new law, which confers authority and appropriates funds sufficient to make it much more comprehensive and efficient than in previous years. Most of the establishments under Federal inspection are large and are grouped at stock centers, although there are quite a number of smaller isolated establishments. The local authorities must often deal with small, scattered, poorly equipped, and very insanitary slaughterhouses, and it is sometimes out of the question to require the reconstruction of the buildings and the installation of expensive equipment in order to bring about a proper sanitary condition.

There are two main problems in an efficient system of local meat inspection. The first relates to the location, construction, equipment, and management of the slaughterhouses, and the second to the administration of the inspection service.

#### A MUNICIPAL OR CENTRAL SLAUGHTERHOUSE.

It is both difficult and expensive to supervise slaughtering at a number of small, isolated establishments, each killing only a few head of animals a day, or perhaps slaughtering only once or twice or three times a week. It is therefore desirable to concentrate the slaughtering for each community into one place. There should be a

public slaughterhouse under either municipal or private ownership, and in either case under official supervision. Municipal abattoirs are quite common in Europe and have been found to be an exceedingly satisfactory method of enforcing an efficient inspection, but such abattoirs are very few in this country. Aside from facilitating inspection and making it more economical, central abattoirs afford commercial advantages. They provide machinery, facilities, and equipment such as are found in the large packing houses and which are not otherwise available to the small butchers. There is also economy in the cost of operation of a central abattoir as compared with the cost of a number of scattered places, and there is an opportunity to obtain revenue from by-products which are usually wasted at small establishments.

It is preferable for the town to build and own the abattoir and to require all slaughtering to be done there, except where conditions are such as to justify private plants and where inspection is already in effect at such plants or can readily be applied. Where it is not practicable for the municipality to own and operate an abattoir the next best plan is to have a central public abattoir owned and operated by private enterprise, and in that case the plant should of course be under an official inspection system.

The expense of building a municipal plant could very well be met by an issue of bonds, and a sinking fund for the payment of these bonds could be created by setting aside a portion of the revenue. There should be a system of fees or charges to provide an income sufficient to pay the cost of operating and maintaining the abattoir and the cost of inspection, and to meet interest and provide a sinking fund in case bonds have been issued. A certain sum per head could be charged for killing in case the entire operations were carried on by the management of the abattoir, or the butchers could be permitted to bring their stock to the abattoir and do the work there themselves by paying a certain sum per head for this privilege.

Where the slaughtering is done at a central place the system of inspection used in the Federal service can very easily be adopted,<sup>1</sup> but where there is very little slaughtering, and this is done at different points, it is a difficult problem to work out a system of inspection that will be efficient and not too expensive.

#### THE INSPECTION FORCE AND SOME FEATURES OF INSPECTION.

It is very desirable to have the inspection done by veterinarians whenever possible. A man who is a graduate of a good veterinary college is not only specially trained to recognize animal diseases, but also has a good knowledge of the danger of such diseases to

<sup>1</sup> For a description of the Federal inspection system the reader is referred to Bureau of Animal Industry Circular 125 and to the current regulations.

human health. If a veterinarian is not available in some of the small villages the services of a local physician might be obtained. A physician without special veterinary training would not have the required knowledge of animal diseases and would not be able to recognize such diseases as readily as a veterinarian would. It is part of the veterinarian's special education not only to know about animal diseases, but to know, so far as science has determined, whether or not they are communicable to human beings, and to know when diseases and conditions found in animals are likely to be detrimental to the health of the human consumer of the meat.

Whenever it is necessary that laymen be employed to carry on inspection either by themselves or as assistants to veterinarians or physicians, they should have received special instruction in meat inspection under competent instructors. Where a layman is assigned to inspect in some remote place it could be arranged for him to send specimens of all doubtful cases to the chief inspector at some central point where they could receive proper examination, the carcass being held until a decision is reached.

Perhaps the most satisfactory plan of compensating the inspectors is for the State or the municipality to pay them annual salaries. No inspector should under any circumstances receive his pay directly from the slaughterers, for reasons that are obvious. The expense of inspection may be met by charging fees, but these fees should go into the State or municipal treasury, and not directly from the meat dealer or slaughterer to the inspector.

Where one man has to inspect at more than one place it will be necessary to arrange the times and days of slaughtering so that he can cover all places satisfactorily. A schedule could be arranged by which slaughtering would be done at one place on one day, at another place on another day, and so on; or slaughtering could be done at one place in the morning and at another in the afternoon. In Germany there are inspectors who cover several towns and who are known as ambulatory inspectors. It might also be permissible under some conditions and when absolutely necessary to permit slaughtering in the absence of the inspector, provided all carcasses and viscera are retained for his examination later. If the inspector can not be actually present at the time of slaughter the viscera should be held, under refrigeration if necessary, until he can pass on the animal.

Animals killed on the farm and brought to town for sale present a difficulty which may be met fairly well by requiring that they must have certain viscera attached and be brought to a certain point for inspection.

In the writer's opinion, when animals are found affected with any disease or condition which renders them unfit for food the producer should suffer the loss rather than the butcher, just as is the custom of the trade when fruit is found decayed or in bad condition or when



wheat is moldy or spoiled. Even with the most expert ante-mortem inspection most of the cases of tuberculosis can not be detected, and usually the purchaser of a live animal is unable to determine until after slaughter whether or not it is diseased. The fairest way is for animals to be bought subject to their condition as disclosed at slaughter. When a carcass is condemned the loss should fall on the man who raised and sold the diseased animal. The presence of tuberculosis in cattle or hogs is usually due to the negligence of the farmer who raised them, and as long as he can sell them for full price there is no great incentive for him to get rid of the infection; but as soon as he begins to feel the financial loss he will find it to his advantage to eradicate the disease. On the other hand, the man who raises healthy stock should receive full price and should not have to share in the general depreciation of prices when buyers naturally take into consideration the fact that they will probably sustain some loss from disease.

It seems to me, too, that at least a portion of the loss on account of animals condemned in the meat inspection should be borne by the State or the municipality. The condemnations are made for the protection of the public health, and it is only reasonable that a part of the loss should be paid from the public treasury. The State of Pennsylvania has a law providing that when animals killed for food are found to be affected with tuberculosis and condemned the owner shall be reimbursed to an amount not exceeding 5 cents a pound for the dressed meat, or \$25 for the entire carcass. Under this law the State live-stock sanitary board has fixed a scale of rates to be paid in such cases, ranging from 2 to 5 cents a pound dressed weight, according to the class and condition of the animal. Under this system the loss is divided between the State and the owner of the animal.

The use of injurious preservatives should be prohibited, as is done under Federal inspection. The Bureau of Animal Industry has found from examination of numerous samples that the use of preservatives which are prohibited by the Federal Government in food products is quite general among local dealers and others who are not subjected to inspection.

Meat that has been inspected and passed may be marked in the same way as in the Federal service, by means of a metal stamp and a specially prepared purple ink.

If a system of local inspection is to provide adequate protection to the health of the community it should cover absolutely all meat offered for public sale which has not been subjected to Federal or other competent inspection. All places of slaughter should be subject to inspection and regulation and permitted only by license. If any uninspected meat is allowed to be sold or if any slaughtering places are allowed to remain uninspected there will be danger to the health

of the community. If an unscrupulous man wishes to dispose of diseased or suspicious-looking live stock he will take it to the place that is without inspection. If one man is allowed to maintain an uninspected slaughterhouse there will be a great temptation for him to buy stock that would not pass at the inspected places, and thus a single exception may be a source of great danger to the health of the people.

#### A MUNICIPAL SLAUGHTERHOUSE AT PARIS, TEX.

The city of Paris, Tex., in 1909 erected a municipal abattoir which is said to be the first such plant in the United States. The abattoir is located about  $1\frac{1}{2}$  miles from the city, and is a one-story wooden structure consisting of slaughtering department, chill room, cooler, tank room or reduction plant, power house, dressing room, toilet room, and storage room for fertilizer, the latter being located about 80 feet from the main building. The cost of this plant was about \$10,000.

The daily capacity of the abattoir is about 30 beeves. The number of calves, hogs, and sheep that could be handled daily would probably be slightly in excess of that number. The slaughtering room is about 22 feet square with cement floor and painted wooden walls. There are three sewer drains discharging into a septic tank located about 50 feet from the building. All slaughtering operations are conducted in this room. The carcasses are hoisted by means of a hand windlass, which is a rather slow method.

The chill room is 10 by 18 feet, with cement floor, three walls plastered with cement and the other wall of wood. A temperature of 40° F. is maintained, and all carcasses are retained in this room for 12 hours before being removed to the cooler.

The cooler is 28 by 22 feet, with cement floor, cement plastered walls, and sewer connections. Refrigeration is supplied by a 10-ton ammonia plant.

The tank room or reduction plant is a small compartment adjoining the slaughtering department. It is equipped with one tank. The offal is handled by means of a windlass and rail. The rendered fat is sold to local laundries, and the tankage is disposed of as fertilizer. The sewage from this room is piped to the septic tank.

The inspection is performed by a veterinarian who receives a salary of \$1,200 a year. The following fees are charged for killing: Cattle, \$1.25 a head; hogs, sheep, and calves, 75 cents each. The patron receives the hide, liver, heart, caul, tail, and brain. Carcasses may be held in the cooler for 5 days and delivered to butcher shops or markets free of charge. For each additional day a charge of 10 cents is made.

According to the mayor, Hon. E. H. McCuistion, the receipts from the operation of the abattoir for the first 6 months averaged \$701 a month, while the average expenses were \$562 a month, showing an average monthly profit of \$139. The receipts from the plant are expected to pay not only the running expenses but the interest on the bonds which were issued to raise money for the construction of the plant, and to provide a sinking fund with which to meet the bonds when they mature.

Mayor McCuistion has the following to say with regard to the abattoir and the circumstances leading up to the undertaking:

Almost every person operating meat markets in the city maintained a separate slaughterhouse at which he slaughtered the animals sold at his market. The structures were rough plank; the location was usually in some thicket or in a swamp, and immediately surrounding each of the houses hogs were kept for the purpose of destroying the offal and waste from slaughtered animals. These pens being removed from the city the only water used was ordinarily from a pool on the premises or a shallow well. In either case it was about as filthy as it could be. During the summer season flies were about the premises in untold millions, and as soon as the animals were slaughtered they would rise up from the dump heaps and cover the carcasses. The odor naturally, of course, was terrific, and indeed the whole surroundings were such that it appeared to us that meat slaughtered under such conditions was not at all fit for food.

We tried for two years to induce the butchers to form a stock company and build an abattoir and reduction plant, operate it themselves, allowing the city to furnish an inspector only; but on account of jealousy and business rivalry this could not be done. The city then decided to undertake the work.

It is the purpose of the city to operate the plant without a profit. We have made charges which are supposed to cover the items of operation, insurance, interest and sinking fund for bonds, and allow 10 per cent for repairs. The total operating expense is about \$400 per month, outside of fuel. The inspector who inspects at the abattoir is also the inspector of markets, grocery stores, confectioneries, dairy herds, and dairy products, and the fees for all these inspections are turned into the abattoir fund, and in that way aid in keeping not only the prices of slaughter and cold storage down to the minimum, but also aid in keeping all inspection fees down to the point where they are not a burden in any portion of our sanitary field.

Our plan is that all animals slaughtered for the local markets shall be brought to the municipal plant, and there undergo first a live inspection by a thoroughly competent inspector, after which they are slaughtered and then undergo the dead inspection. The rules governing the inspection are the same as observed by inspectors of the National Government in the packing plants of the country.

#### A PUBLIC SLAUGHTERHOUSE AT NASHVILLE, TENN.

In Nashville, Tenn., there is a public slaughterhouse owned by a corporation, the stock in which is held by a number of local meat dealers. This is a well-constructed brick building costing about \$75,000. The plant has a daily capacity of 100 cattle, 300 hogs, and 100 sheep. The inspections are made by a veterinarian in the employ

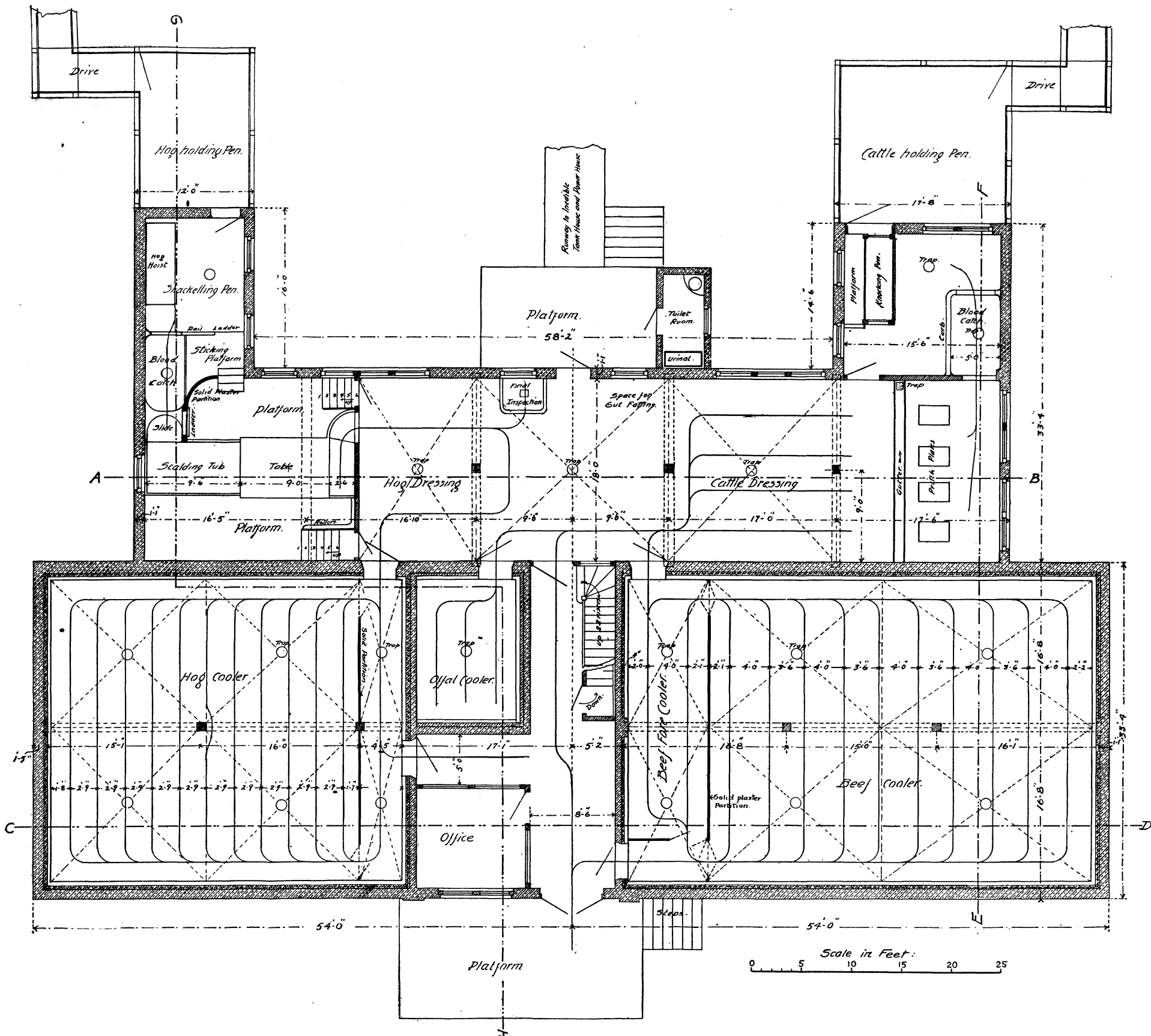


FIG. 17.—Plan for municipal slaughterhouse (first story).

of the city board of health. The charges for slaughtering are 75 cents a head for cattle, 25 cents for calves, and 15 cents for sheep and hogs. The association pays the owners of the animals for the hides, tallow, grease, and offal, these products being sold each month to the highest bidder. The city laws of Nashville require that all fresh meats sold in the city shall be from either city or Government inspected carcasses.

#### PLAN AND SPECIFICATIONS FOR A CENTRAL ABATTOIR.

I have had prepared by Mr. G. H. Parks, architect in the Bureau of Animal Industry, the accompanying plans, specifications, and estimates for a central abattoir of capacity sufficient for a small city of about 20,000 population. (See Figs. 17, 18, and 19.) Such a plant would cost from \$12,500 up, according to capacity.

One building would comprise the slaughterhouse, containing the killing room, the cattle-dressing room, and the gut-handling space, divided as follows: Killing room, 14 feet by 15 feet 6 inches; cattle-dressing room and gut-handling space, 18 feet by 54 feet; all dimensions inside. Cost, frame construction, cement floors, walls cement lined, and ceiled roof, about \$2,500.

A cooler building 32 by 48 by 20 feet inside, with concrete or stone foundation, wood walls and ceiling, composition roof, concrete floor, and cork insulated walls and floor, would cost about \$3,000, and the machinery for the same, including refrigerating plant, would cost installed about \$5,000.

The tank or rendering building should be so built that it will not be connected with the abattoir, and it can contain the steam plant. The rendering tank will require a floor space of about 5 by 10 feet. A building 16 by 24 feet, 14 feet high, will accommodate the steam plant and the rendering tank. A building of frame construction would cost about \$500, and the steam plant and rendering tank can be installed for \$2,500.

In this power house should be installed a dynamo to generate electricity for power to drive the motors on the cattle hoists, the motor for running the refrigerating machine located in the basement of the abattoir, and the electric lights and fans.

The slaughterhouse is constructed with two killing beds and has a maximum capacity of 150 cattle a day of 10 hours, but the cooler building has a daily capacity of only 10 cattle, 12 sheep, and 4 calves, on a basis of holding the carcasses 5 days. If hogs are to be killed another slaughter room 18 by 34 feet with a wing 10 by 15 feet, all inside dimensions, should be constructed, and additional cooler space provided, which would require an additional outlay of about \$9,000 for a capacity of 22 hogs a day. This would bring the total cost of the plant up to \$22,500. Concrete construction throughout would cost about 50 per cent more than frame construction.

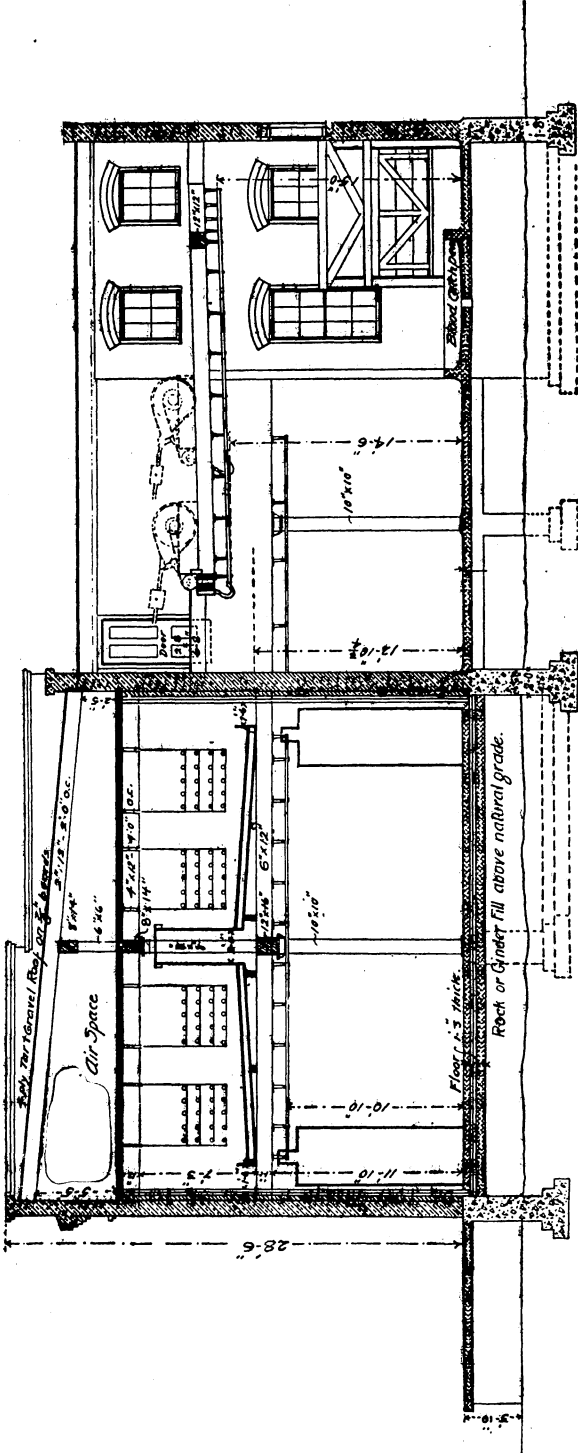
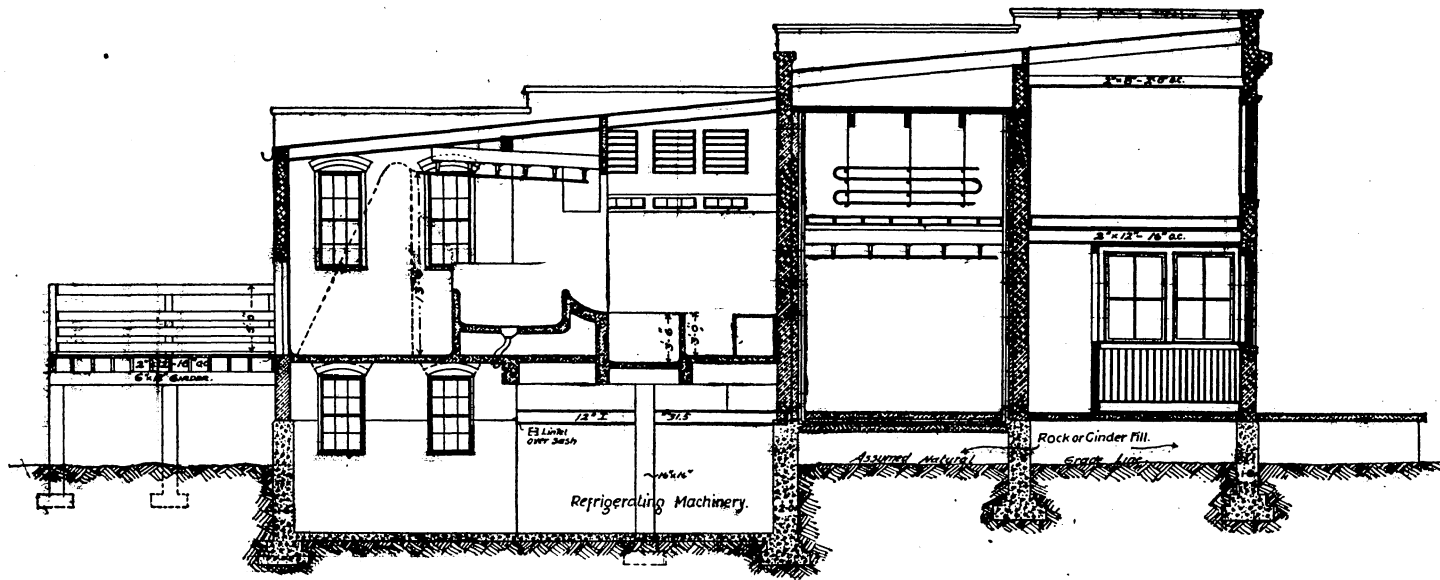


FIG. 18.—Cross section of municipal slaughterhouse. (Section on line B-F in fig. 17.)







pounds green weight. If the killing were done once in 3 days the amount of offal would be about 2,850 pounds. When rendered into tallow and fertilizer this material would have a market value of about \$24, which would amount to about \$2,400 a year realized from the tankage. The cost of installing the rendering tank would be about \$2,400. It is not likely that any extra labor would have to be employed to look after the tank. The cost of operation of the tank, including power, interest on investment, depreciation of the plant and fixed charges, such as insurance and office expenses, would be about \$615 a year. The profit from disposing of the offal in this way is therefore estimated at \$1,785 a year, which would make the installation of a rendering tank an exceedingly profitable investment.

If a rendering tank is not installed the offal should be put into closed metal containers and removed from the premises after each day's killing.

When a municipal sewer is provided, the sewage, except from the toilet, should be run into a concrete catch basin and from the basin to the city sewer. Sewage from the toilet should go directly to the city sewer without first passing through the catch basin. The catch basin is constructed as a long, narrow trough having partitions or weirs at right angles to its sides. The weirs retain most of the grease that is contained in the sewage. The grease can be skimmed off and put into the rendering tank. The catch basin should be located outside the abattoir and in such position that the odors will not permeate the abattoir, and should be provided with a tight cover.

When no municipal sewer is available the sewage from the catch basin and from the toilet should be run to a septic tank. The septic tank is made in a similar manner to the catch basin, but is so arranged that it contains two or three chambers into which the light and air are not allowed to enter. In these dark chambers the solid matter is decomposed and converted into liquid; the liquid is then conveyed over a bed of sand or carried away through agricultural tile and distributed. The chambers or compartments should be large enough to hold at least two days' supply of the sewage. If the sewage is to be carried over a filter or sand bed, the second compartment should be so contrived that the sewage will be syphoned intermittently. Sewer pipe to the septic tank should have a fall of 1 foot in 40 feet and be below the frost line. The tank should be 5 feet below the inlet. A plan for a septic tank is shown in figure 20.

#### LOCAL INSPECTION WITHOUT CENTRAL ABATTOIR.

In communities where a public or central abattoir is impracticable the inspection authorities should exercise close supervision over the private slaughterhouses and enforce sanitation so far as possible under the circumstances.

Certain features necessary in the production of wholesome meat are usually lacking at local abattoirs, as, for example, sewerage and a good supply of pure water, both hot and cold.

Perhaps the most difficult problem in a small slaughterhouse is the disposal of the offal. This material should not be allowed to be fed to hogs, and should be disposed of in some way so that hogs, dogs, and other animals can not have access to it. When practicable a rendering tank should be provided for the offal and for such meat or product as may be condemned, and there should be facilities for applying steam to this tank. This equipment, however, would be too expensive for many small places, and some other method of disposing of offal must be found.

When a rendering tank is not practicable it would be well to have a septic tank, as already described. If this can not be done, the contents of the stomach and intestines might be removed and hauled away and spread on the ground, where they would have some fertilizing value. The other offal in the form of tissue, as well as heads, feet, etc., might be rendered in a kettle, the grease utilized, the bones collected at intervals and sold if practicable, and the residue used as fertilizer. It is much better to render such material than to throw it on the ground and allow it to decompose.

In a local system of inspection where no tanking facilities are provided there should be some simple way of treating condemned meat so it can not be sold for food. Perhaps the best and simplest way is to put kerosene on it.

#### BUREAU WILL FURNISH PLANS AND INFORMATION.

In carrying out local inspection the principles and rules laid down in the Federal regulations should be followed so far as possible. The Bureau of Animal Industry will be glad to furnish copies of its regulations and any other information or advice in its power to State or municipal officers who are interested in establishing local inspection. The bureau will also be glad to furnish plans and specifications and such other information as it can give with regard to the designing, construction, equipment, and operation of public abattoirs.

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